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A Pediatric Emergency Discharge Teaching Intervention: A Pilot Study for Management of Acute Vomiting and/or Diarrhea

by

Wendy Dianne Gillespie

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Nursing

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *A Pediatric Emergency Discharge Teaching Intervention: A Pilot Study for Management of Acute Vomiting and/or Diarrhea* by *Wendy Dianne Gillespie* in partial fulfillment of the requirements for the degree of *Master of Nursing*.

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Abstract

A new discharge teaching intervention was designed for use with parents whose children were experiencing the symptoms of vomiting and/or diarrhea after being seen in an urban Pediatric Emergency Department. This was a descriptive, exploratory pilot study using qualitative and quantitative methodologies to analyze the effectiveness of the teaching intervention and handout. Data were collected through in-person and follow-up telephone surveys. Positive parental responses were obtained supporting the use of the new handout. Analyses of parental confidence and their ability to apply the knowledge in the handout along with decisions to return or not to return for further assessment of their child by a physician were conducted. Modifying factors from the Health Belief Model were included in the analysis. Of the modifying factors, only the single-family household variable had a statistically significant impact on type of return. Results indicate the potential benefits of using the new discharge teaching intervention handout in future studies and in clinical settings.

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Chapter One

Introduction

Children commonly present to a Pediatric Emergency Department (PED) with symptoms of vomiting, diarrhea, and possible dehydration. Children experience 1 to 2.5 episodes of gastroenteritis (a common cause of vomiting and/or diarrhea) each year which translates into 2 to 3.7 million physician visits and approximately 320 000 hospitalizations in the United States of America in a given year (Prescilla, 2002; Santucci & Marby, 2002). Many children have received treatment by their own physician or by another emergency physician for the same complaint within the previous few days. With the demands for health care in the current system frequently exceeding the resources available, expedient use of emergency care services is desirable. People may use emergency services for minor symptoms that they could manage themselves at home because they do not have the knowledge to differentiate serious symptoms. With the appropriate determination and management of minor ailments at home, people would use Emergency Departments only for true emergencies.

Children contract a large number of viral and bacterial illnesses that may present with symptoms of vomiting and diarrhea that can lead to dehydration especially if the symptoms are not recognized early and treated appropriately. Dehydration is a potentially dangerous condition for children and requires urgent and appropriate treatment. The challenge is to differentiate between those cases that require professional expertise and those that can be managed safely at home. In many instances, parents of children with vomiting and/or diarrhea are not always confident about how to manage their child's

condition at home nor are they able to judge when it is serious enough for medical attention.

Currently, the discharge teaching for parents of children with vomiting and/or diarrhea in the setting of this study, a Western Canadian large urban hospital PED is at the discretion of the health professional staff on duty. Pamphlets, written in English, on vomiting, diarrhea and the prevention of dehydration are freely available for the parents to take on their own or for the health professional to provide as a handout if he or she so chooses. While verbal information is often given to the parents at this time, no standardized teaching plan is followed. Follow-up calls to the family, after they leave the hospital, occur only to communicate abnormal laboratory tests. The Emergency Department policy is not to give medical advice over the telephone, so parents who call back after an initial visit are encouraged to call a major telephone health information service available in the urban center or are advised to return to the PED for reassessment. These protocols related to telephone advice encourage parents to bring their children back to the hospital during the course of the illness (L. Grono, personal communication, August 20, 2003).

The PED can be an extremely busy environment. Nurses and physicians hurry from patient to patient to attend to the needs of everyone and manage crises as they arise. With this in mind, a teaching intervention that lends itself to the needs of the parents while respecting the limited amount of time the nurses and physicians have is necessary. The information in the handout needs to be clear and understandable so it can stand on its own as a resource for parents because the teaching sessions can easily be interrupted at any time. Since children from birth to 17 (less a day) come to the PED, any teaching

strategy needs to incorporate all pediatric developmental stages and include age appropriate information. The study hospital serves children from all sections of the city and as a result, the healthcare providers encounter families with diverse educational backgrounds and situational needs as well. To be effective, teaching strategies need to address these factors. Based on a review of the literature examining the teaching and learning principles of adults and parents with children and teaching in a critical care/emergency environment, the discharge teaching intervention for this study was developed to address both the learning needs of the parents as well as the time restraints experienced by PED nurses and physicians.

With a deliberate, focused discharge teaching plan to help parents of children with vomiting and/or diarrhea learn about their child's condition, this study was a pilot test of an instructional handout that describes the causes, symptoms and treatments of vomiting and diarrhea for parents. It was designed to help parents decide when it is appropriate and/or inappropriate to bring their child back to a general practitioner (GP), to the child's own pediatrician or to the PED for further assessment.

Chapter Two

Literature Review

Elements of Effective Teaching and Learning

Teaching as a Strategic Process

Whitman, Graham, Gleit and Boyd (1992) identify the four steps of the teaching process as assessing, planning, implementing and evaluating. In order for desired learning outcomes to be attained each step needs to be considered. Assessment involves determining what the patient needs to learn. Once the instructor identifies the learning needs of the student, a plan outlining the proposed outcomes or goals and objectives and strategies for helping the patient attain them is developed. Ideally, the assessment and plan is a shared experience between the nurse and the patient as learning goals that are meaningful to the patient are more readily attained (Whitman et al, 1992). Whether this happens or not depends upon the time available and often, the nurse's orientation towards teaching.

Orientation toward Teaching

One of the most challenging aspects of teaching in emergency settings is finding the time to teach. London (1999) has described the 'teachable moment' and the importance of utilizing whatever available time there is to teach, suggesting that some of the most effective teaching is done while caring for the patient when his or her readiness to learn is high. Such teaching often occurs informally without the planning or preparation (Whitman et al , 1992). According to London, a nurse oriented towards teaching actively listens and seeks to create teachable moments. In settings such as

Emergency Departments where time is at a premium, such an orientation is of paramount importance.

Gessner (1989) argued that teaching integrates easily with other elements of holistic nursing care. With reference to Knowles' definition of teaching as "the art and science of helping adults learn" (p. 589), Gessner (1989) argued that teachers who are supportive and encouraging can positively influence learning outcomes in spite of less than perfect conditions for learning.

Learner Centered Focus

According to Reutter and Ford (1997), parents need to be taught to manage their children's conditions at home by nurses who can focus on teaching what is needed. In this study, parents viewed information obtained from health professionals as one of the most highly identified goals for successful access to the healthcare system. As well, these parents claimed to learn best from scenarios relevant to their experience. By presenting different views of a situation, correcting misinformation, giving positive feedback and being there for the patient and family, the nurse can provide "anticipatory guidance" (p.146). While it is hoped that all decisions are based on accurate and up-to-date information, a nurse oriented to the needs of the patient and family accepts that their decisions may not always be the same as those of the health professional (Reutter & Ford, 1997).

Obstacles to Learning

In their discussion about the elements of teaching and learning for adult learners, Austin, Matlack II, Dunn, Kesler and Brown (1995) discovered a high rate of adult illiteracy and subsequent problems for teaching and learning sessions. They found that

the inclusion of illustrations increased the potential for learning in all groups of adult learners. As long as the material lends itself to illustrations, they concluded that illustrations were one way to address illiteracy

According to Bruccoliere (2000), physical disability, vision loss, hearing loss, impaired cognition, poor language skills, stress, and pain can prevent learning from occurring. Bruccoliere argued that desired learning outcomes are attained when nurses know what the patient needs to learn, make the time to teach, start with simple concepts, progress as the patient can tolerate, and maintain the interest in the topic by making the session fun, being aware of personal and cultural beliefs, and fostering active participation.

Caregiver communication problems specifically in Emergency Departments have been examined by Corbett, White, and Wittlake (2000) and are believed to be due to patient perceptions of the wait times, staff compassion, information provided, organization of the staff, courteousness of the staff, and technical quality of care. To change the expectations of the patients, an information videotape was played in the Emergency Department waiting room. As a result, patients had a better understanding of the process they were entering and were more accepting of the subsequent experience. Corbett et al. concluded that basic Emergency Department information provided in the video informed and reassured patients in a time of personal crisis which ultimately lead to better caregiver–patient interactions.

Jolly, Scott, and Sanford (1995) found that the biggest problem for patient teaching in Emergency Departments was adult illiteracy, which translated into an inability to read at the fourth grade level. This was a problem for nearly thirteen percent

of the adult population in the United States of America. They found no significant differences between literate and illiterate patients in the amount of information acquired in their study, and speculated that this was due to the large drop-out rate by study participants during the course of the study.

Wei and Camargo (2000) identified other barriers to education in an Emergency Department. These included: an unpredictable environment, limited staff, unpredictable number of patients at any given time, high patient anxiety, disorientation and hostile moods, and a lack of standardized patient care. Wei and Camarago argued for the importance of singular or episodic patient teaching in the emergency care setting when patients and their families may be particularly receptive to learning because of their heightened concern and attention. In their view, written information developed with the realities of low literacy and illiteracy in mind, as well as verbal information and telephone follow-up calls were necessary for learning and for heightened patient compliance with discharge teaching. Furthermore, they emphasized that such materials be available and easily accessible so that teaching can occur within the general constraints of an Emergency Department setting.

When Karlsen (1997) examined nurses' perceptions of patient teaching, he found a discrepancy between ideal patient education and actual practice. While nurses perceived teaching to be an important nursing role, they generally felt unprepared to teach. Their teaching efforts tended to be unstructured, inconsistent and varied depending on which nurse was conducting the session. Two approaches to teaching were observed even though nurses found it difficult to describe the ideals of patient teaching. The first approach to teaching was one where nurses provided general information to patients

without assessing their individual learning needs. The planning phase was dependent on the ward routine and relied upon general content, the information "necessary [for] all patients to have to be well prepared to meet the hospital ward, as well as facing difficult procedures" (Karlsen, p.100). The second approach occurred with patients suffering from acute and/or chronic illnesses. In this case, the assessment of learning needs happened as recommended in theory but there was less formal preparation and management. The planning step with the development of learning objectives and strategies was not necessarily articulated. Rather, nurses just taught what came to mind using strategies with which they were personally comfortable. No plans were made for evaluating learning outcomes or how effective the teaching strategies were in helping those patients attain the desired outcomes. How nurses approached patient teaching depended upon their preparation to teach, their professional knowledge and development of teaching skills as well as the support given to patient education in the work setting.

Kozak, Yura, and Norfolk (1989) found patient teaching listed as a major nursing responsibility in their study about routine patient teaching in Emergency Departments. However, many of the nurses reported that they had no time to teach in spite of their failure to provide patient education increasing the risk of liability. Kozak et al., argued that patient learning in the Emergency Department and subsequent compliance with the prescribed discharge regime depended as much on the patient's ability to comprehend and remember information, motivation to learn and self-perception about being able to perform the tasks as it did on what and how nurses carried out patient education. They argued, however, that it was essential for the nurses to determine the effectiveness of

patient education strategies and that by substantiating their choices "teaching effectiveness would support standards of care and decrease nurse liability" (p. 18).

To determine which type of patient education was superior, Kozak et al (1989) examined three groups of patients. The first group received a written information pamphlet. The second group received the information pamphlet and a verbal review of the pamphlet. The third group received both the pamphlet, a verbal review of it as well as well follow-up verbal reinforcement by the nurse. While there was no statistically significant differences in the learning that occurred within each of the three patient groups, Kozak et al. suggested that this may have been due to the fact that the small sample size was neither randomized nor representative. The direction of the results however, supported the use of both written and verbal education methods.

Facilitators of Learning

In his clinical report of what constrains teaching in a medical office, Okstein (1993) developed a computerized handout system that included the physician's name, the diagnosis and an explanation, the projected course of the injury/illness, home care instructions, warning signs and complications, medication information, follow-up information and related information about common illnesses and medical problems. Such a strategy reinforced the information the physician provided, improved adherence with the prescribed regime, improved communication with home care coordination, improved documentation, and improved the patient's overall perception of the clinic.

Rifas, Morris, and Grady (1995) described a hospital department devoted to patient teaching that utilized one-on-one instruction, small group instruction, on-going classes, a videotape library, telephone coaching, and a variety of instructional aides.

According to Rifas et al., patients benefited both from the time dedicated to teaching and learning and from the health professionals who understood theories of learning and direct their energy and time to patient teaching.

Yingling and Trocino (1997) argued that patient and family education is an integral component of healthcare. Through effective teaching and learning experiences, patients are empowered to adopt healthier lifestyles and manage their personal health care decision-making. To Yingling and Trocino, such empowerment depended upon health care providers letting go of their conventional role of authority and creating the circumstances so their patients could be active participants and partners in health care decision-making processes. These included providing consistent accurate, health information, actively collaborating with patients, and recognizing that patients are ultimately responsible for their own health care decisions. Youngblut and Shiao (1992) have also observed that resources offered should depend upon the parents' perceived need and not those of the healthcare professional. Even when in crisis, the individual's reaction is dependent upon "a realistic perception of the … event, available situational support, [and] adequate coping mechanisms" (p. 80 – 81).

Clinical Teaching with Children/Families

According to Becker, McGhan, Dolovich, Proudlock and Mitchell (1994) specific goals and a means for achieving them, quality information, positive reinforcement, opportunities to practice skills and a format that appeals to children are necessary for teaching children and their families effectively. In their meta-analysis of articles written about teaching the pediatric primary care patient and family, Glascoe, Oberlkaid, Dworkin, and Trimm (1998) examined the value of written and verbal information,

modeling and role playing, and group teaching in pediatric settings. They concluded that written information focusing on specific information is most effective when combined with counseling. Conditions that reduced learning included using written material that contained advanced vocabulary, teaching in a stressful environment and the parental perceptions that the severity of their child's illness was serious.

To improve learning, Glascoe et al. (1998) made several recommendations for health care professionals to consider. The first recommendation was to explore parental understanding of their child's condition, behavior and development as well as their worries about the visit. The use of standardized instructions including prewritten materials and culturally sensitive videotapes in settings conducive to viewing, and informational handouts at an appropriate reading level was their second recommendation. The third and forth recommendations were to incorporate a media campaign or follow–up phone call to reinforce the learning and finally using a combination of verbal or computer teaching and learning programs along with personalized written materials makes teaching more effective.

Glascoe et al. observed how *group well visits*, where parents met to discuss their concerns, were effective learning experiences that originated from the other participants and rather than the health professional. Health care professionals who were family focused and provided culturally sensitive care using a family systems approach resulted in a more complete assessment of the family and ultimately, a better relationship with the patients and their families. Hymovich (1986) made similar observations.

Crisis Theory: Implications for Learning in Emergency Settings

A visit to the Emergency Department represents a crisis for patients and their families. Any teaching intervention must take into account the state of crisis in which a family finds itself. It is important to remember that the Emergency Department setting is not one that people plan to go to, nor is it one that is always conducive to in-depth teaching sessions. Researchers have used the Crisis Theory to examine people's responses to learning in such environments.

Woolley (1990) applied crisis theory to families with critically ill patients suggesting that if "holistic nursing is to be practiced effectively, the family must be considered" (p. 1402). Because illness is the most common source of situational stress for a family, the nurse needs to remember other events might be affecting the lives of the patient and family besides the admission to the Emergency Department (Woolley, 1990). For example, all members of the patient's family are at different developmental stages, bringing in the component of maturational crisis. Hospitalization can also bring with it the stress of separation from family. Problems associated with this include the lack of social contacts, imposed autonomy, changes in the child's basic schedule with meals and sleep times, financial concerns for the parents, and a new and possibly uncomfortable hospital environment. For Woolley, it is important to focus on the child's or family member's perception of the situation, his or her support structures and the coping abilities he or she has to get through the crisis. The steps of the process closely follow the nursing process of assessment, planning, intervention and evaluation followed by crisis resolution. Here the child or family member resolves the crisis or examines why it is not

resolved and how to cope with the situation. Nurses can help the family and child evaluate the outcome and deal with the repercussions of the crisis on his or her life.

Farrell and Frost (1992) have applied crisis theory to studying the needs of parents with critically ill children. Because of the nature of many severe childhood illnesses, massive interventions are often necessary, rendering the parent as the original caregiver to one of an observer for the duration of the admission. This can have a stressful impact on the parents of the child. Farrell and Frost suggested that parents be involved in as much of the care and care decisions as possible to help them "adapt and respond to the change in their own requirements that their child's admission demands" (p. 132). The parents in Farrell and Frosts' study identified their need for information, to learn how to lessen their anxiety about their child's illness, for the healthcare professionals to be accessible to them, to be included in decisions about their child, and finally, to feel confident that their children were receiving the appropriate care that they needed. Farrell and Frost further discovered that no matter how involved the parents were in their child's care, they needed to feel it was acceptable rather than right or wrong to more or less involved. Finally, the critical care personnel needed to understand the great level of trust these parents placed upon them as they relinquished the care of their child to the health professionals.

Chapter Three

The Health Belief Model as A Basis for Patient Education Interventions

Elements of the Health Belief Model (HBM) (Appendix 1) were considered when the discharge teaching intervention was developed for this study because of the model's relevance to patient discharge teaching. Lewan first introduced the model. Becker, Haefner, Kasl, Kirscht, Maiman and Rosenstock then modified it in 1977. To Becker et. al (1977), health beliefs and subsequent actions for health outcomes are dependant upon several factors. The first factor is the individual perceptions about the seriousness of a disease and their susceptibility to it. The influences of modifying factors that include demographic, social/psychological, structural variables and cues to action compose the second factor; and the third factor involves the individual perceptions about the benefits of and barriers to following through with prescribed health actions. The individual's "perceived … susceptibility to the particular illness and … his/her perceptions of the probable severity of the consequences … of contracting the disease" (p.29) combine to produce the degree of threat of a particular disease or problem. The perceived benefits and barriers to taking the recommended action and the modifying factors influence the individual's perception of threat. These include age, sex, ethnicity, personality, social class, reference groups, knowledge about and prior contact with the disease and cues to action such as symptoms, beliefs, the effects of mass media information, advice from others and attention to the disease from others. The "feasibility and efficaciousness" (Becker et al., p. 30) in following a recommended course of action ultimately involves the individual's ability to weigh out the benefits and barriers such action might bring to him/her. While a number of "demographic, personal, structural, and social factors" (p.

30) can have an impact on an individual's choices in action, they are not considered direct cues to act.

Although initially proposed to understand preventative measures, this model has also been used to explore the underlying reasons for compliance and non-compliance with prescribed health regimes and patient teaching (Redman, 1993). According to Rankin and Stallings (2001), the HBM was used to theorize that "a patient's belief in his or her personal susceptibility to, and the severity of a health condition, are important variables influencing the decision to take action to prevent health problems" (p. 38). For instance, if a patient feels little or no susceptibility to an illness, a HBM perspective would emphasize the importance of providing accurate and current information about the illness so that the patient is making a fully informed about his/her susceptibility. The barriers and benefits of the treatment as well as the cues to action must be considered. Any health intervention undertaken with the components of the HBM in mind must take into account the circumstances and perceptions of the individual for whom the intervention is intended.

Mikkail (1981) used the HBM modifying health beliefs to accommodate "fear communications [which] included manipulation … of perceived susceptibility…, perceived severity of that condition, or perceived efficacy of the recommended action" (p.73). From his perspective, the fear drive paradigm "assumes that the emotional response of fear functions as a drive that mediates belief and behavior change … more fearful messages lead to greater persuasion" (p. 74). The patients had less fear if he or she went along with the recommendations. Another process involved is "the perceptual

cognitive process [which] mediates reactions to communications and gives rise to fear and adaptive behaviors" (p. 74).

With these two processes interacting to influence individual actions, Mikkail (1981) suggested several implications for nursing. Because of the unique pattern of beliefs for each individual, it is necessary to identify individual differences and those at particular risk for non-compliance. With that knowledge, it is important that nurses select interventions that best match the patient variables that related to the model. The unique interaction that nurses have with patients and their family contributes to the nurse being able to personalize health care interventions, including patient teaching.

Jones, Jones, and Katz (1988) applied the HBM to an Emergency Department setting oriented to treating and providing information to a population with non-urgent illnesses or conditions. They stated that many patients used this Emergency Department as a primary source of medical treatment and health information. From their observations, little emphasis was given to discharge instruction and referrals provided. Patients were not motivated to follow the advice provided or to schedule and attend a recommended follow-up appointment. In this study, the variables were standardized interventions based on the HBM and a follow-up phone call. The interventions consisted of an assessment of the patient that emphasized the "perceived susceptibility, perceived seriousness, benefits, cost, and cues to action" (p. 1175), a pre-established protocol, an illness related intervention, and the teaching required for their presenting illness. One group of subjects received routine nursing care with no follow-up (control group). A second group received routine nursing care with a follow-up phone call. A third group received the intervention but no follow-up call. A fourth group received both the

intervention and follow-up call. Compliance (defined as scheduling and attending the follow-up appointment) was highest for patients who received some form of intervention (i.e. in the hospital or in the form of a follow-up phone call) with the highest level of compliance in the group receiving both of the interventions. These patients also showed a greater interest in their own care after discharge. Jones et al. concluded an appropriately designed intervention based on the HBM was not only effective in influencing the choices an individual will make when facing an illness, but was also cost effective.

To be effective, a teaching intervention based on the HBM must consider all the elements of the model to influence the likelihood of an individual taking the recommended course of action. For this proposed study, it is argued that the HBM accommodates not only individual perceptions and beliefs brought to a situation by a particular patient and his/her family, but the experience of crisis many have when coming to an Emergency Department setting as a health care option. The heightened parental concern surrounding a PED visit and subsequent discharge teaching necessitates that any health care and teaching intervention must be personalized, accurate, clear, inclusive of the learning needs, easily accessible, and in a form that people can refer to at later points in time. The design of the discharge teaching intervention handout was completed with these criteria in mind (Appendix 2).

The intervention in this study was meant to be adaptable to the needs of the family of the particular PED patient. The information in the handout attempted to address the concept of perceived susceptibility by explaining what diarrhea and/or vomiting was, why these symptoms could pose a threat to a child, and when a child needed reassessment by a physician. One specific barrier to action (literacy) was addressed by making the

discharge teaching intervention handout readable (Grade 5 reading level) and easy to follow in order to make decisions about their child's care at home. As an intervention that is accurate, complete and easy to use, it was hoped that the discharge teaching intervention handout would be perceived for its efficacy by the healthcare professionals in the PED. Demographic data about the family and the pediatric patients who participated in this study could all be classified as modifying factors in the HBM. The intervention itself became a cue to action for the parents. Together, all of the considerations that went into designing the discharge intervention and the handout were oriented towards helping the parent participants make appropriate decisions about the care requirements of their child.

Chapter Four

The Method

Purpose

The PED nurses and/or physicians, when dealing with parents whose child experiences the symptoms of vomiting and/or diarrhea secondary to a viral infection, currently provide no standardized discharge teaching or follow-up calls at the study site. While the consistent use of standardized handout materials accompanied with a video and some form of follow-up support for the parents after discharge seem ideal, time and economic implications undermine their implementation as parts of a discharge teaching intervention. Evidence was found in the literature to show that standard discharge teaching along with follow-up telephone calls to the parents, influence parental confidence and decision making in managing their child's health care needs at home after being seen for vomiting and/or diarrhea in a PED setting.

This study was a pilot test of an in-person discharge teaching intervention utilizing an information handout especially designed for parents to use in making decisions about the kind of care their child needed following an initial visit to the PED for symptoms of vomiting and/or diarrhea secondary to a viral infection. Parents were provided with the knowledge deemed necessary to recognize when it was appropriate to return to the PED or to their own GP/pediatrician for further assessment and treatment for their child with continuing symptoms of vomiting and/or diarrhea. Conversely, parents needed to know when it was safe to keep their child at home. The results from this pilot study of the discharge teaching intervention demonstrated the feasibility for a future fully powered clinical trial utilizing the information handout.

Research Questions

The following research questions guided the collection of data for the study:

1) What are the perceptions of the parents receiving the discharge teaching intervention regarding the:

a) ease in reading the information handout

b) ease in understanding the information in the handout

c) ease in applying the information in the handout to their child's situation

d) perceived inclusiveness/completeness of the information within the handout

e) general impression of the format of the information handout?

2) After having the discharge teaching intervention information handout reviewed and taking it home with them, how confident do parents feel in:

a) taking their child home after the initial visit to the PED.

b) managing their child's symptoms at home to prevent dehydration

c) being able to recognize signs of dehydration in their child seven days after their child's initial discharge from the PED?

3) Were the parents' self-perceived abilities to apply the information in the discharge teaching intervention handout congruent with their actual abilities to apply the same information to an age appropriate(for their child) hypothetical situation seven days after their child's initial discharge from the PED?

4) During the seven days following their child's initial discharge from the PED, what is the rate of physiologically warranted returns, non-physiologically warranted returns, and physiologically warranted non-returns to either the PED or the child's own general practitioner (GP) or pediatrician for reassessment?

5) Were there relationships between parent confidence levels about taking their child home after the initial visit to PED, managing their child's symptoms at home to prevent dehydration and being able to recognize signs of dehydration in their child with the rates of physiologically warranted returns, non–physiologically warranted returns and physiologically warranted non–returns?

6) Were there relationships between the parents' self-perceived ability to apply the information when their child was discharged from PED and their actual ability to apply it to an age appropriate hypothetical situation seven days after the initial discharge from the PED with the rates of physiologically warranted returns, non–physiologically warranted returns and physiologically warranted non–returns?

7) What factors are related to a parent's decision to return to either the PED or the child's own GP/pediatrician for continuing symptoms of vomiting and/or diarrhea secondary to a viral infection?

Factors that might affect a parent's decision to remain at home or to seek further medical assessment of their child after his/her initial discharge for symptoms of vomiting and/or diarrhea were drawn from the modifying factors listed in the HBM (Appendix 1). These included:

a) age of children

b) number and age of siblings

c) parental age

d) single versus two-parent household,

e) where children spend days and evenings when healthy or sick

f) previous experience with diarrhea and vomiting management

g) presence of chronic illness or disability

h) education level of the parent(s)

i) use of a regular GP/pediatrician

j) use of community healthcare services

k) is anyone else in the household sick, if yes, how many people

An exploratory descriptive analysis of these factors will contribute to future studies about the best way to support frequent users of PED through teaching interventions tailored to their needs.

Operational definitions

1. A physiologically warranted return was defined as return to the PED or to the child's GP/pediatrician within seven days for reasons congruent with the recommendations in the intervention handout. This type of return was determined through a chart review. A physiologically warranted return was one where:
    a) the child was admitted to the hospital for worsening dehydration and further management;
    b) the child was referred to specialists for further assessment (e.g. a surgeon or gastroenterologist);
    c) there were abnormal laboratory or radiographic findings when such tests were ordered; and,
    d) the child's condition was not improving and/or they were found to have signs of worsening vomiting and/or diarrhea as stated in the discharge teaching intervention handout.

2. A non-physiologically warranted return was a return to the PED or to the child's GP/pediatrician within seven days for reasons other than those listed in the intervention handout and not resulting from a potential deterioration of the child's health. A non-physiologically warranted return was one where:
    a) the child's condition had not been determined by the PED physician to have worsened;
    b) the child was only kept in the PED for oral rehydration and/or observation;
    c) there were no abnormal laboratory and/or radiographic test findings;
    d) an intravenous was inserted merely to obtain blood samples and then to maintain an open line; and,
    e) referrals were made to the pediatric clinic because the child did not have a GP/pediatrician or referrals were made for psychosocial reasons (e.g. to a social worker or other aid agencies).
3. A physiologically warranted non-return was defined as not returning to the PED or to the child's GP/pediatrician within seven days for reassessment because the child's condition either stayed the same or improved.
4. Confidence was defined as the parent's stated perception of his/her own ability to recognize symptoms in their child that required reassessment by a physician and their self-perceived ability to care for their child during the course of the illness.

Setting

The PED site selected for this study was in a Western Canadian large urban hospital. It is a twelve-bed unit for the assessment and treatment of patients less than the

age of 17 years. These patient units provided a relatively private space for the discharge teaching intervention to occur with few interruptions.

Sample

Inclusion Criteria

The parent-child dyads were considered eligible for the study if:

1) the child was less than 17 years old,
2) the child was experiencing vomiting and/or diarrhea secondary to a suspected viral infection (e.g. gastroenteritis),
3) the child had either no or mild dehydration defined by the Canadian Pediatric Society as being less then 5% dehydration (Nutrition Committee, 2000) as assessed by the PED physician,
4) the child was considered suitable for discharge within the upcoming hour as indicated by the treating physician,
5) the parent was able to speak and read English,
6) the parent was able to be reached by telephone seven days after the initial discharge.

The group of at least 40 parent-child dyads formed the convenience sample. Thirty participants were enrolled on days when the principle investigator was not working as a PED nurse. Due to staff requests and an identified need for the discharge teaching intervention information, 10 participants were enrolled when the principle investigator was working but not as a primary care giver for the participants.

Exclusion Criteria

Criteria for not including a parent-child dyad in to the study were that:

1) the child was admitted to hospital,

2) the child suffered from moderate to severe dehydration (greater than five percent) as defined by the Canadian Pediatric Society (Nutrition Committee, 2000) and as determined by the PED physician,

3) the child's vomiting and/or diarrhea was judged to be due to anything but a viral cause (e.g. surgical problem, pre-existing medical condition such as Crohn's disease, etc.),

4) the child or one of her/his siblings was previously enrolled in the study.

Study Design

This study was a descriptive, explorative design in which a discharge teaching intervention and handout was developed. The handout itself was designed to address components of the HBM and using principles of adult teaching and learning to produce an esthetically pleasing and easy to use resource for parents.

The main component of the study involved developing the information handout that I used as the standard discharge teaching intervention for those parents of children assessed in an initial visit to the PED for symptoms of vomiting and/or diarrhea secondary to a viral infection. After reading the patient information package provided to them and answering their questions about the study, those who chose to participate signed the consent form (Appendix 3) and completed the demographic information survey: about you and your child (Appendix 4). Their agreement included allowing me to contact them by telephone 7 days later for a follow-up call. The discharge teaching intervention occurred and the parents received their discharge intervention materials. Once their questions were addressed, the physician was notified and the parent-child dyad was discharged from the PED.

Seven days post-discharge, the participants were contacted by telephone to complete the Follow-Up Questionnaire (Appendix 5). The data collected at this point addressed the seven research questions for this study. First parents were asked to describe their perceptions of the discharge teaching information handout. Second, parents were asked to rate their confidence in using the discharge teaching intervention information handout seven days after discharge from the PED. Parents were then asked to rate their ability to apply the information provided in the discharge teaching intervention handout and were given a two part hypothetical scenario, at an age level representative of their own child. They were then asked to describe what actions they would take using the information in the handout as a resource. They were asked whether they took their child back to the PED or other health care services for physician reassessment of their child. An analysis of any potential relationships between the parents' perceptions of their confidence at the time of discharge and the rate of returns or non–returns for physician reassessment was conducted. Another analysis of any potential relationships between the parents' self–perceived and actual ability to apply the information from the handout to decisions about their child's health care needs in a hypothetical scenario and the types of returns the parent-child dyad did or did not make was done. Finally, parents were asked to provide demographic information about themselves, their children and certain household factors. These variables were analyzed for potential relationships with the types of returns or non-returns made by the parent-child dyads.

Intervention

The Discharge Teaching Information Handout

A variety of patient information handouts currently exist on the subject of managing vomiting and diarrhea in children. None of the available handouts on the subject of vomiting and/or diarrhea are consistently used by all of the physicians and nurses at the PED. In order to develop a standard information handout, currently used information handouts were obtained and a search of internet sources of information was conducted. This included approaching several PED physicians for their opinions about these sources of information. Based on their responses, it was clear that a new and improved information handout was necessary for helping parents make effective decisions about their children's health care needs.

The new handout was developed by synthesizing materials about pediatric vomiting and/or diarrhea and rehydration from the World Health Organization (WHO), the Canadian Pediatric Society (CPS) and the American Association of Pediatrics (AAP). Oral rehydration formula packages developed and distributed by the WHO contain sodium and carbohydrates (either glucose or rice based) and are reconstituted for oral administration by adding water (Victora, Bryce, Fontaine & Monasch, 2000). Their formulations were described in the *Expert Consultation on Oral Rehydration Salts Formulation* recommendations put forth by the World Health Organization's Child Health and Development Department in July 2001 (WHO, 2001). This group of experts reviewed studies conducted on oral rehydration formulas with the intent of providing "technical recommendations to WHO and UNICEF on the safety and efficacy of reduced

osmolarity [oral rehydration strategies] in … children with acute non-cholera diarrhea" (WHO 2001, p. 3)

Based on these recommendations, the CPS position statement entitled *Oral Rehydration therapy and Early Refeeding in the Management of Childhood Gastroenteritis* was developed in 1994 by an expert CPS Nutrition Committee, reviewed by the CPS Board of Directors, and then published in the peer-reviewed journal *Paediatrics and Child Health*. In 1996, a group of AAP members with expertise in the fields of gastroenterology, infectious diseases, pediatric practice, and epidemiology developed the American equivalent of this document. The subcommittee, the Provisional Committee on Quality Improvement, a review panel of practitioners, and other groups of experts within and outside the AAP reviewed and revised these parameters. Recommendations from these three sources formed the basis of the discharge teaching intervention information handout developed for this pilot study.

Other considerations in the development of the information handout for this study included making the content accessible and appropriate for different physiological development stages: 0-6 months; 7-24 months; 2-5 years; 6-17 years (Appendix 3). As recommended in the health education literature, it was written at the fifth grade level to accommodate a common literacy level. Beyond being accurate and current, the handout design had to be attractive, inclusive, succinct and easy to use by parents and health professionals alike.

Several PED nurses were asked to review an initial draft of the information handout. Their feedback about its content, usefulness, accessibility, inclusiveness, appeal and accuracy was used for developing a second draft. The members of the thesis

supervisory committee for this study as well as several PED physicians reviewed this second draft. With this second round of suggestions, the information handout was then formatted, addressing the issues of uniformity and meaningfulness of color selection, conciseness in the number of pages needed to produce the intervention, and consistency in the order of material presented in the individual columns. At this point, an Emergency Department educator and the PED physician member of the thesis supervisory committee for the study made one final review to ensure the material was current, evidence based, contained necessary information for parents to make informed decisions, and was appropriately worded for parental comprehension.

Study Procedures

Ethical Considerations

The main ethical concern in this study focused on informed and voluntary consent. All potential participants received the patient information sheet, which outlined the purpose and procedure of the study. They were informed of the possible benefits of participating in the study. These included: 1) personalized discharge teaching; 2) more extensive follow-up contact than what normally occurs; and, 3) the possibility of having an impact on the care of future pediatric patients with vomiting and/or diarrhea and dehydration. The participants were reassured that there were no significant risks for the child or parent participating in the study. Participation in the study was not expected to prolong their time in the department. They were assured that the information collected for the study would be kept confidential and locked in a secure location inaccessible to anyone other than my committee members and myself. Participation was voluntary and the decision to withdraw from the study could be made at any time without repercussions.

Potential study participants were encouraged to ask any questions they had about the study prior to deciding whether they wanted to participate. Written consent was obtained from the parents prior to the initiation of the study. Parents were told at the time of enrolment and at the time of the follow-up telephone call that the telephone interview would be taped to ensure their responses were complete and accurate. They were informed as well that should their child return for further medical assessment to the PED, the child's hospital records would be accessed and reviewed to analyze the reason for the return visit by the principle researcher only. No copies of these records were to be made. Only the information on the PED chart review summary form (Appendix 6) would be recorded for the purpose of the study.

Approval for conducting the study was obtained from the manager of the Pediatric Emergency, the Research Director for the Emergency Department and the Medical Director of the PED according to current research in practice protocols. Ethical approval for conducting the study was also obtained from the University of Alberta Health Research Ethics Board: Panel B.

Information for the emergency personnel

Prior to commencing the study, the study site PED physicians and nurses were informed of the purpose of the study and their role in the study. This role was to ask the parents and children who met the inclusion criteria if they were willing to have their name given to me for information about the study when a potential study participant was within one hour of discharge. A poster was placed in the PED to facilitate contacting me. As an additional incentive to ensure their help with the enrollment procedure, the

physicians and nurses were told that there would be two draws for prizes planned for the end of the study to thank them for their role in initiating the enrollment process.

Recruitment of participants

As planned, PED physicians and nurses approached those who met the study inclusion criteria and obtained their verbal assent to have their names forwarded to me as potential study participants. After being contacted by the PED personnel, I came to the hospital to tell the parents about the study. The parents then had the opportunity to review the patient information sheet by themselves (Appendix 3) and choose whether they wished to participate in the study. If they chose to participate, I obtained their written consent (Appendix 3). If they chose not to participate, I advised the PED physician and nurses who then provided the discharge teaching they would normally do.

Prior to my carrying out the discharge teaching intervention, the parents completed the Demographic Information Survey for data about the child and the parent(s) (Appendix 4). This included questions about the child's age, the number and age of siblings, history of a similar illness before, a chronic illness or disability and if the child had a GP/pediatrician. Parents were also asked about their age, their relationship to the child, whether they are part of a single or 2-parental household, their own levels of education, and their use of community health services. While this information was collected to help describe the group of parent-child dyads who participated in the study, it also included some of the factors outlined in the HBM that might affect the parent's decision to return to either the PED or the child's own GP/pediatrician for continuing symptoms of vomiting and/or diarrhea secondary to a viral infection.

Initiating the teaching intervention

With parental consent obtained, I met with the parent in the privacy of a PED cubicle to review the discharge teaching intervention handout (Appendix 2). Depending on which symptom the child demonstrated when admitted to the PED, the age-specific information about vomiting and/or diarrhea outlined on the handout was reviewed. In order to maintain a standard approach to the teaching intervention, I tried not to give additional information but answered questions to clarify any areas of concern for the parents. Occasionally, the parents had questions about other symptoms that their child was experiencing. In those cases, I provided them with the information that was available in the department. The most common request for additional information was about how to manage a fever. With their questions answered, I asked the parents to consider two age-appropriate hypothetical scenarios. They were then to state what they would do in these situations (for their child) using the discharge teaching information handout as a guide. When this was completed, I gave the parent the laminated information handout to take home for future reference. At this point, the PED physician discharged the child and addressed any further non-study related questions. No further contact for teaching occurred after discharge. In order to remember any special characteristics of the parent-child dyads, I attempted to keep field notes. The notes described salient points about the intervention that had just been conducted such as who was in the room, any distractions that might have occurred and personal information about the participants to help me remember with whom I was speaking at the time of the post-discharge follow-up telephone call.

The teaching session adhered to the principles of adult learning. The parent was encouraged to be an active participant in the session. The session included any member of the child's family who wished to learn how to use the discharge teaching information handout. The information was relevant as it was both situational and age-specific. The hypothetical scenarios at the end of the discussion provided the parents with an opportunity to review and practice applying the information to situations like their own. To many parents, the take-home copy of the information handout was a bonus. In its laminated form, it was substantial and something that could withstand the wear and tear of an active home with young children.

The follow-up telephone call

The follow-up telephone call occurred seven days after discharge at a time that was convenient for the parent. I made the calls from my home and, with permission obtained from the parent prior to commencing the follow up questionnaire, taped and transcribed our conversation (Appendix 5).

The parents were asked to rate how easy it was to read, understand and use the discharge teaching information handout, how inclusive/complete it was and their general impressions of its overall format and appearance. Their suggestions were sought for how to make the handout better. They were then asked to rate how confident they felt taking their child home, managing their child's symptoms at home, and being able to recognize the signs of dehydration after going over the information handout in the PED and having it with them to refer to at home. To determine who was involved with the care of the child during illness, I asked the parents where their child had spent their days and evenings since their discharge. Whether or not the parent took their child back for further

assessment by physicians at the study site PED or by another physician service was also explored. At the end of the call, the parents were asked to explain what they would do in a hypothetical scenario if it were their child in the situation.

Emergency Department Chart Review

If the child was reported to have returned to the PED, a chart review was done for the post-discharge visit(s) to analyze whether the reason was a physiologically or non-physiologically warranted one. This was only for analysis and not communicated to the parent. No judgment was expressed to the parent about their stated reason for reassessment provided during this follow-up call. The chart review included assessing the history obtained from the parents by the PED personnel, diagnostic or radiographic tests ordered and the presence/absence of abnormal findings, treatment administered (for example intravenous rehydration, oral rehydration, observation), admission to hospital and further referrals made for the child. If the discharge teaching intervention was successful, subsequent visits should have only been necessary if the child's condition worsened or did not improve significantly.

Measures

Information Handout Feedback

To have the parents evaluate the discharge teaching intervention handout, five 10 point numeric rating scale questions were developed. Because of a strong correlation between numerical rating scales and visual analogue scales and a high level of "overall equivalence of measures based on the regression analysis", Bijur, Latimer, and Gallagher (2002, p. 391) argued that ten point numerical rating scales were a reliable means to assess patient perceptions in emergency settings. In this study, the parent perceptions

about their ease in reading, understanding and using the information handout, the inclusiveness/completeness of the handout and their overall impression of its format were measured using five 10 point unsegmented numerical rating scales where 1 represented "not at all" and 10, "completely". Additional comments about the information handout were incorporated in the study discussion and conclusions.

Parental Confidence Levels

The second research question of this study explored how confident parents felt about taking their child home after the initial visit to the PED, managing their child's symptoms at home to prevent dehydration, and being able to recognize signs of dehydration in their child while at home. Three 10 point unsegmented numerical rating scales were used when parents were asked to rate their confidence levels. As with the numeric rating scale questions for the evaluation of the handout, a score of 1 represented "not at all" and 10, "completely.

Application of Knowledge

The ability of parents to apply the handout information was assessed during the telephone follow-up call in two ways. Using one 10 point unsegmented numerical rating scale where 1 represented "not at all" and 10, "completely", the parents were first asked, "How well do you feel you were able to apply the information in the handout to managing your own child's vomiting and/or diarrhea?" At the end of the call, the parents were asked what he or she would do in an age appropriate hypothetical scenario if the child in the situation were his or her child. As a two-part scenario, a complete and accurate response received a score of two. If one part was correct, it received a score of 1

and if no responses were correct, a score of zero. A partially correct response on either of the two parts received a score of 0.5.

Returns

The fourth research question of this study examined the rates of physiologically warranted returns, non-physiologically warranted returns and physiologically warranted non-returns for further assessment by a physician. This question was answered in part by the parent's response regarding whether their child had returned for further assessment to a physician after their initial PED discharge. Parents of children who went to a non-study site physician were asked to describe what made them decide to see the physician, what the physician told them and what had been done for their child. For those children who returned to the PED, the chart review already described was completed.

Based on this information, all children who returned for further assessment by a physician were classified as either a physiologically or non-physiologically warranted return. This determination took into consideration the history obtained from the parents, diagnostic or radiographic tests ordered, presence/absence of abnormal findings, treatment administered (for example intravenous rehydration, oral rehydration, observation), whether the child was admitted into the hospital and whether any referrals were made for the child. I determined the nature of the return for children who were subsequently seen by their own GP/pediatrician by using the description of care provided by the parents at the time of the follow-up telephone call.

Confidence Ratings – Return Rate Relationship

The fifth research question examined whether a relationship existed between the parents perceived confidence levels at different points in the study and in the type of

returns they made with their child. The three confidence markers were the parents' confidence at the time of initial discharge from the PED, at home when caring for their child's symptoms and when watching their child for the possibility of dehydration developing. In order to answer this question, parent confidence ratings from research question two were analyzed in relation to the return/non-return data collected.

Application Ability – Return Rate Relationship

The sixth research question of this study explored whether the parents' perceived ability to use the handout information for managing their child's condition and their actual ability to apply it to an age appropriate hypothetical situation were related to their child being classified as a physiologically warranted return, non-physiologically warranted return or physiologically warranted non-return. In order to answer this question, the perception of parent ability to apply ratings and their actual ability to apply the information in a hypothetical scenario score were assessed in relation to whether the child was classified as a physiologically, non-physiologically warranted return or physiologically warranted non-return.

Data Entry and Verification

The data for this study were entered into a Microsoft Excel 2002 spreadsheet. The data were then transferred to SPSS version 11.5 and modified in format only to fit the program requirements. Data were verified for accuracy, prior to analysis, by repeated visual checks. Participants were asked to give a rating on nine different questions using unsegmented numeric rating scales. For each scale, the parents were asked to choose a value between 1 and 10 with one representing "not at all" and ten representing "completely". Some participants choose a value between two whole

numbers. For these data, I tossed a coin. Heads indicated to round the value up to the next higher whole number and tails meant to round the value down to the next lower whole number.

Chapter Five

Results

Demographics of the Study Participants

The study involved forty-two parent-child dyads during its eight-week duration. Thirty-eight of the 42 dyads completed the study. Single parent households comprised seven of the 42 parent-child dyads, while the other 35 parent-child dyads were from 2-parent households. Three of the single parent household dyads and one of the 2-parent household dyads did not complete the final survey. Of the 42 participating children, 21 were male and 21 were female. For analysis, the children's ages were categorized according to clinically relevant groupings identified in the discharge teaching intervention handout. The parents' ages were also grouped into groupings of ten years for the analysis. Seven fathers and 35 mothers provided the required study information. These parents completed both the demographic and the follow-up telephone questionnaires. The parent's levels of education ranged from being in high school to having competed graduate level university education. Two parents (4.8 %) reported having completed some high school; five parents (11.9 %) reported completing high school; four parents (9.5 %) had completed some university or college education; 27 parents (64.3 %) had completed university or college; and the remaining four parents (9.5%) had some amount of post-graduate education. The education levels of the parents were due to the PED being located on a university site.

Table 5-1

Sample Demographics

Variables	n	X	SD	range
Child's age (years)	42	2.87	2.83	0.42–12.25
Number of siblings	42	0.90	1.00	0.00–4.00
Parent's age (years)	42	31.71	6.44	18.00–50.00

The study sample was comprised of younger children, which is not surprising given that nearly half of the parents reported no prior experience managing vomiting and/or diarrhea with their children. The parents were slightly older than I expected. This again could have been influenced by the location of the PED or could be a reflection of trends in child-rearing practices in society where parents get married later, concentrate on establishing a career and then have children slightly later in life. The majority of the children had no siblings (42.9%) or had one sibling (40.5%) which could explain why so many parents had little or no experience with managing vomiting and/or diarrhea.

Table 5-2

Experiential Demographics

Variable	Yes	(%)	No	(%)
Experience with managing vomiting/diarrhea	22	(52.4%)	20	(47.6%)
Presence of Chronic Illness	3	(7.1%)	39	(92.9%)
Has general practitioner/pediatrician	38	(90.5%)	4	(9.5%)
Routinely uses community health services	33	(78.6%)	9	(21.4%)
Better at time of follow-up telephone call	32	(76.2%)	5	(14.4%)

Note: a = use of telephone advice line, use of public health clinic and use of other community resources; b = missing 4 of 42 participants (9.5%)

In the demographic survey, the parents were asked if their child had any type of chronic illness or disability. Three parents stated that their child had some form of chronic illness. These illnesses included diabetes (one child), epilepsy (one child) and severe asthma (one

child). It was left to the parents to define the term 'chronic illness' so some children with other minor ailments may not have been captured with this question.

Parents were also asked about their usage of community health resources. While the majority identified a telephone advice service, others spoke with professional colleagues or friends in the healthcare industry, used the public health centers, or used alternative health providers.

Table 5-3

Days/evenings When Healthy/sick

Variable	At Home (%)	Outside care or school (%)	In Hospital (%)
		Healthy	
Day	20 (47.6%)	22[a] (52.4%)	-
Evening	42 (100%)	-	-
		Sick[b]	
Day	28 (66.7%)	7[c](16.7%)	3 (7.1%)
Evening	35 (83.3%)	-	3 (7.1%)

Note: a = daycare, day-home, school, playschool and babysitter; b = missing 4 cases (9.5%); c = daycare, school, playschool

During the day when the children were healthy, twenty of them were at home, eleven were at daycare or a day-home, seven were at school, one was at playschool and three were with a babysitter. In the evening, when the children were healthy, all forty-two were at home with their parents. When the children were sick, 28 were at home, four were at a daycare or day-home, three were in the hospital two were at school and one was at playschool. In the evenings, when the children were sick, 35 were at home, and three were in the hospital.

At the time of the follow-up telephone call, 33 children had recovered, with one just released from the hospital on that day. One child had measles, one child had a cold, one was newly sick with viral symptoms, one had an ear infection and one was still lethargic compared to normal. None of the children required further assessment by a physician at that time.

Information Handout Feedback

During the follow-up telephone call, parents were asked to rate their perceptions about the discharge teaching handout according to a ten point numerical rating scale. They were told that a score of 1 represented 'not at all' and a score of 10 represented 'completely'.

Table 5-4
Handout Ratings

Handout Ratings	X	SD	range
Ease of Reading	9.38	0.95	6 -10
Ease of Understanding	9.54	0.72	7-10
Ease of Use	9.08	1.40	4-10
Completeness	9.30	1.17	5.5-10
Overall Impression, (format and appearance)	9.22	1.13	6-10

Note: n = 38

The ratings for the handout numeric rating scales were high; there was little variation between the scores and as a result, the standard deviation was narrow. This could be the result of a response set phenomena. This can occur when similar questions are grouped together and the respondents have difficulty discriminating between answers to the questions and fall into a pattern of responses. To avoid this, future researchers might want to redistribute the specific questions about the handout ratings throughout the

survey or vary the format of the questions. It is possible that the handout was well received and that this was reflected in the quantitative analysis.

Parental Confidence Levels

During the follow-up survey, parents were asked to rate their own level of confidence at three times during their child's illness. The first was at the time that the child was discharged from the initial PED visit. Parents were also asked to rate their confidence level in managing their child at home following the initial visit to the PED and they were asked to rate their confidence level in assessing their child for signs/symptoms of dehydration. All of these confidence levels were based on having the parents use the discharge teaching intervention handout as a reference. The standard deviations were large and the ratings were less consistent than the ratings for the handout evaluation questions

Table 5-5

Confidence Ratings

Parental Confidence	X	SD	range
At initial discharge from PED	8.49	1.39	5 - 10
Managing vomiting and/or diarrhea at home	8.78	1.14	6 - 10
Recognizing dehydration	8.75	1.29	5 -10

Note: n = 38

Application of Knowledge

Parents were asked to rate their impression of their ability to apply the information in the discharge teaching intervention handout to their own home situations. The mean score for the numeric rating scale was 8.96 with a standard deviation of 1.2 and a range of 4 - 10.

The parents were also given an age appropriate (for their child) hypothetical scenario and asked what they would do if it was their child in the situation in order to analyze the parent's actual ability to use the information. A parent who was only partially correct in their answer on one part of the situation received a score of 0.5. If a parent's answer was entirely correct for one part of the scenario, they received a score of 1. For parents who answered one part of the scenario entirely correctly and were partially correct on the second part of the scenario, they received a score of 1.5. Parents whose entire answers were correct for both parts of the scenario received a score of 2. The mean score for the application scenario was 1.5 with a standard deviation of 1.5 and a range of 0.5 to 2.

A Pearson correlation was done between the parents' self-perceived ability to apply the information in the discharge teaching intervention handout and their scores on the hypothetical situation. The Pearson correlation between the numerical rating scale and the actual mark received for the hypothetical situation was 0.23, which was not significant. As measured in this study there was no relationship between the parents' perceived ability to apply the information from the discharge teaching intervention and their actual ability to apply the information to a hypothetical situation.

Returns

During the follow-up telephone survey, parents were asked whether they brought their child back to a physician for reassessment of vomiting and/or diarrhea and if they did, to whom they brought their child. Bases on the analysis and data were sorted into the three study categories. These were physiologically warranted returns, non-physiologically

warranted returns, and non-returns according to the reports of parents for those returning to GP/pediatricians and the PED chart review for those returning to the PED.

Table 5-6

Type of Returns

Type of Return	Number	Percentage
	Physiologically warranted	
To GP/pediatrician	1	2.3 %
To PED	5	11.9 %
	Non–physiologically warranted	
To GP/pediatrician	8	19.1 %
To PED	3	7.1 %
	Non-return	
	21	50.0%

Note: n = 38, missing 4

Confidence Rating – Return Rate Relationship

A chi-square test for independence was done between the independent variables of parental confidence levels measured at the time of initial discharge from the PED, at home when parents are trying to care for their child and manage his or her illness, and at home when trying to recognize signs or symptoms of dehydration in their child. The dependent variable was the type of returns. Clinically, I expected that increased parental confidence supported by the use of the discharge teaching intervention handout would help parents to decide to return to the PED for physiologically warranted reasons or not to return for further assessment of their child. Therefore, I expected a decrease in the number of non-physiologically warranted returns.

Table 5-7

Chi-square Test of Independence Between Parental Confidence and Return Type

Confidence/Return Types	χ^2	d.f	p
Confidence at discharge and return types	12.75	10	0.24
Confidence managing illness and return types	8.48	8	0.39
Confidence recognizing dehydration and return types	11.28	10	0.34

Note: n = 38, 4 missing

In this study, the chi-square tests for independence were not significant for the numeric rating scales values parents chose to represent their levels of confidence and the types of returns their child experienced for management of vomiting and/or diarrhea.

Application Ability – Return Rate Relationship

During the follow–up telephone call, parents were asked to rate their perceived ability to manage their child's illness at home using the discharge teaching intervention handout as a resource. The parents were given a numeric rating scale with a score of 1 representing 'not at all' and a score of 10 representing 'completely' thus creating a ten point numeric rating scale. At the end of the telephone interview, parents were given a hypothetical situation in an age appropriate format for their child to consider. They were asked to use the information in the handout and from the discharge teaching intervention to help them to decide what they would do in the situation should their child experience what was described. These scores were tabulated and chi-square tests for independence were done to determine if a relationship existed between either of the application items

and the types of returns made by the children following the initial PED visit. None of the tests in this analysis were significant.

Table 5-8

Chi-square Tests of Independence Between Application Ability and Return Type

Application scores and return types	χ^2	d.f.	p
Numeric rating score and type of return	9.19	8	0.33
Score on scenario and type of return	2.42	6	0.88

Note: n = 38, 4 missing

For this study sample, there was no statistically significant relationship between the parents' ratings on the numeric rating scale for their ability to apply the handout information and the types of returns their children made for further management of vomiting and/or diarrhea. There was also no statistically significant relationship between the parents' application score and the return types of the children.

Influential Variables

During the initial session, the parents completed a demographic survey, which included questions about the identified potentially influential variables identified by the Health Belief Model. Once it was determined which of the return types the child made during the study, these variables and the return types chi-square tests for independence were done to determine if any relationships existed between the independent variable (the influential variable) and the dependent variable (the type of returns). Three of the variables were statistically significant. These were: 1) single or 2-parent household types; 2) where the child spent days; and, 3) where the child spent their evenings when sick. As expected, all of the children spent their evenings at home when they were healthy. Due to the distribution and small sample size, the results of the chi-square tests for

independence between the variables of days and evenings and when sick and return types are likely not actually statistically significant. There is an issue that these variables may not be categorically sound, as it does not make theoretical sense to expect the majority of children to be anywhere but at home during the time of an illness. A cross tabulation table was done to describe the distribution of the single and two-parent households with their relevant return types. (see Table S-1). There were no non-returns among the single family households, but the distribution of the sample is relatively what was expected statistically. Also, the loss of participants was not equal with three dyads being from the single household cohort and one dyad from the 2-parent cohort.

Table 5-9

Chi-square Tests of Independence Between Influential Variables and Return Type

Variable and Type of Return	χ^2	d.f.	p
Age groups of children and type of return	10.23	6	0.12
Gender of children and type of return	1.53	2	0.47
Number of siblings and type of return	12.67	8	0.12
Age groups of parents and type of return	5.54	10	0.85
Single/ two parent household and type of return	6.47	2	0.04*
Days when healthy and type of return	11.73	8	0.16
Days when sick and type of return	21.60	8	0.01**
Evenings when sick and type of return	17.37	2	0.00**
Prior experience with vomiting/diarrhea and type of return	0.81	2	0.67
Parent education and type of return	5.05	8	0.75
Use of GP/Pediatrician and type of return	2.64	2	0.27
Use of community resources and type of return	5.24	4	0.26
Others sick in house and type of return	2.28	2	0.32

Note: n = 38, 4 missing, * = significant at 0.05, ** = significant at 0.01

Post Hoc Analysis

For the purpose of the study, several ten-point numeric rating scales were developed. Five of the scales were developed to get the parents' ratings of the discharge teaching intervention handout. Three of the scales were to measure the parents' confidence levels in the course of managing their children's illness after the initial discharge from the PED. During the analysis of the data, I noted that the rating that parents gave were remarkably similar to one another. I ran Pearson correlation tests to determine if the similarities in the data were statistically significant. I wanted to know if

the parent participants were using the rating scales in the same way. The Pearson correlations were high between the five handout rating questions suggesting that in future studies they may form part of a scale to evaluate the construct of satisfaction with the discharge teaching intervention handout. The high correlation might also suggest that not all of the questions are necessary, and future studies might select some, but not all of the questions in order to evaluate the effectiveness of the discharge teaching intervention handout for the parent participants.

Table 5-10

Pearson Correlation Coefficients Between Handout Rating Questions

	Ease of reading	Ease of understanding	Ease of use	Completeness	Overall impression
Ease of reading	-				
Ease of understanding	0.734**				
Ease of use	0.482**	0.492**			
Completeness	0.586**	0.599**	0.386*		
Overall impression	0.507**	0.603**	0.534**	0.678**	

Note: Pearson Correlation, Sig. (2 tailed); n=38, * p = 0.05, **p=0.01

Pearson correlation tests were done for the three confidence level rating scales to determine if the individual numeric rating scales could form part of a larger scale to measure the construct of parental confidence in managing childhood vomiting and /or diarrhea using the discharge teaching intervention for future studies. The three numeric rating scales correlated highly suggesting that scale development is possible for the construct of confidence in future research studies or that some of the questions could be redundant for the assessment of the overall construct of parental confidence in this setting.

Table 5-11

Pearson Correlation Coefficients Between Confidence Rating Questions

	At time of discharge	Managing at home	See signs & Symptoms
At time of discharge	-		
Managing at home	0.509**	-	
See signs & symptoms	0.345**	0.533**	-

Note: Pearson Correlation, 2 – Tailed, n = 38, ** p ≤0.01

Chapter 6

Discussion and Conclusions

Summary of Study

As a pilot discharge teaching intervention in a large urban PED, this study sought parental perceptions of an information handout specifically developed to help parents make decisions about the health care needs of their child experiencing symptoms of vomiting and/or diarrhea when discharged home. Of particular interest was whether the information in the handout would affect parent decision-making about their child's need to return to the PED or another physician service for reassessment. Parental perceptions of their ability to read, understand and use information as well as their levels of confidence in taking their child home, managing at home and being able to recognize sign of dehydration were rated and analyzed. Variables that could be classified as modifying factors in the Health Belief Model were also analyzed to determine what else might influence a parent's decision to bring their child back for reassessment.

Changes to The Teaching Intervention

At the beginning of the study, I expected the discharge teaching intervention developed for the study to be applied consistently with every parent-child dyad. As the study progressed, this soon proved to be a challenge. Some parents had no questions and understood the information handout easily within a teaching session lasting the predicted 10 to 15 minutes. Other parents because of their age, language difficulties, interruptions and other distractions needed up to 30 and 40 minutes to go through the information handout. Some of these distractions included attending to other children in the room, attending to the child patient (for example diaper changes, or the child was fussy), or

being interrupted by nursing and/or physician staff during the intervention. When teaching in an Emergency Department, the chaotic nature of the setting and the unpredictable nature of the parent and child's visit can complicate any teaching intervention conducted. The Crisis Theory literature gave a basis for understanding the difficulties of teaching in an Emergency Department. It is difficult to know how the length of the teaching session may have influenced the parent perceptions measured in this study. Some days, the PED was very chaotic and noisy and other days it was quiet. Some parents needed more information on non-study symptoms like fever and how to mange it.

Some parents were able to specifically ask direct questions and seek clarification on their own. For other parents, the need for clarification became apparent in their comments and their non-verbal communication. This meant that the teaching interventions varied between the participants. However, I was able to maintain consistency in the content provided and in the written information given to parents concerning management of vomiting and/or diarrhea. While all study participants received a standard information handout, the way in which it was reviewed changed according to the demands of the situation and the needs of the parents (for example language difficulties or the need for information specific to their child's condition such as fever management). It is difficult to assess how such variation in delivery may have influenced the results of the study.

Information Handout Feedback

The first research question of this study was to determine whether the discharge teaching handout was readable, easily understood and useful to parents who brought their

children to the PED for management of vomiting and/or diarrhea. The quantitative analysis showed that the parents found the handout to be most useful as a resource to refer to when necessary. Parent's comments about the handout during the follow-up telephone calls were congruent with the quantitative data. Some parents reported photocopying the handout and giving it to friends, or referring friends who called them to the handout for information. Several parents (n=25) felt that this handout should be routinely distributed through the PED.

Parents particularly appreciated the clarity of information in the handout regarding fluids to offer their child and timelines to expect for improvement of symptoms. They liked being able to take the handout home to refer to it again. This helped them to review the teaching they had received and addressed questions that they still had. Many parents said the handout was still on their refrigerator doors or with their child's reference items for the next time their child might experience symptoms of vomiting and/or diarrhea.

One suggestion for improving the handout came from parents with children who were lactose intolerant. They would have liked to have known what drinks to substitute for milk. For children who developed fever along with the symptoms of vomiting and/diarrhea, parents suggested including information on fever management. To some parents, diarrhea was not addressed as clearly as vomiting and that the two subjects should be separated. Finally, one parent stated that the handout information contradicted her own beliefs on how to manage vomiting and/or diarrhea. Her doctor allegedly shared her views so she said that she would not follow the handout recommendations.

Parental Confidence Levels

Parents were asked to rate their confidence at the time of their child's initial discharge from the PED, at home while managing their child's illness using the handout, and at home watching their child for signs of dehydration using the handout as a reference. I expected that the parents with high confidence ratings would have fewer non-physiologically warranted returns. In the analysis of this question, the qualitative and quantitative data contradict each other. There was no association between ratings of confidence and the types of returns made by parent-child dyads. It is possible that the parents chose ratings that did not accurately reflect their confidence levels. One parent stated that she did not feel very confident looking for the signs and symptoms of dehydration in her child, yet gave herself a numerical rating of eight on the scale item. This leads to questions about the validity of the numeric rating scale items for measuring parental confidence.

There was a high response set for the numeric rating scales about parental confidence. Parents might have developed a pattern of responses that they provided which in fact did not represent their actual perceptions of their own confidence levels. Also, the risk of social desirability bias from the participants might have been an issue. Here, the participants try to present themselves in the best light to the researcher (Streiner & Norman, 1995). The question(s), the participant's background, the interaction between the participant and the researcher and the context in which the questions are asked can all influence the rating of a study participant. My initial meeting with the participants occurred in the PED, which meant they were not anonymous to me during the telephone follow-up interview. Because the participants were asked to rate themselves on several

subjective items, it is possible their answers were positively skewed. Other possibilities why this form of rating scale was not effective in measuring the concept of parental confidence include sample size and individual participant variables which can not be identified.

Sample Size

While intended as a pilot study, the small sample size could be viewed as a limitation in terms of the quantitative analysis undertaken for the study. After attrition, 38 of the 42 parent-child dyads formed the sample group. Because of this, there were often values or frequencies of less than five in a cell of the matrices from the cross-tabulations or chi-square analyses. A larger sample size would provide sufficient data for analysis.

Qualitative Comments on Parental Confidence

Even though there was no statistical significance with the association between parental confidence and return type, the parental comments were highly favorable about the handout. While many comments supported the positive quantitative responses, several comments provided information about the impact of the handout above and beyond the quantitative measures. For instance, parents spoke about referring to the chart several times in the week their children were ill and how "just having the handout with them at home" made them feel better. Such comments suggest the handout did influence the parents' levels of confidence even though this outcome did not have statistical support.

Application of Knowledge

When considering whether there was an interaction between the parents' perceived and actual ability to apply the discharge teaching information and their

decision to bring their child back for reassessment, the qualitative and quantitative data show different results. Their scores for both the ratings for their perceived application ability and for the hypothetical situations that they were given do not relate to their choice to return with their child for reassessment. As there was only one question concerning their perceived ability to use the information and one hypothetical scenario to actually test their ability to apply the information, these measurements did not fully represent their ability to apply the information in real life situations.

The parents were not asked to get the information handout to use when making their decisions in the hypothetical scenario. I had hoped the parents would remember and be able to apply the information in the handout because it was clear and memorable. This not only required their functioning at a high level of application in the cognitive domain (Bloom, Englehare, Furst, Hill, and Krathwohl, 1956 as cited in Gronlund, 1995), but the level of valuing in affective domain. (Krathwohl, Bloom and Masia, 1964 as cited in Gronlund, 1995). Had I clarified the desired learning level been as the ability to apply the information with the aid of the handout, I should have asked the parents to retrieve and use the handout to answer the hypothetical scenario at the end of the follow-up telephone call. This oversight in thinking through the process for the follow-up question coupled with the lack of clarity in the instructions given to the parents during the follow-up telephone call might have affected the results obtained from parents on the hypothetical situation.

The qualitative data supports the idea that the parents were influenced by the discharge teaching handout and that this subsequently influenced their decision to return or not return for reassessment. One parent claimed that without the chart, she would have

been back to the PED again. All but one parent claimed they referred to the handout and used the information to manage their child's illness at home. Parents stated they would not have gone to the PED if they had had the handout prior to their initial visit. When parents described how they managed their child at home, a majority stated they consulted the handout to see if their child's symptoms were normal or required returning to the PED for reassessment. Some said that they watched their child for the potential development of the symptoms listed in the handout to make sure their child was not getting worse. The format of the handout seemed acceptable to the parents in this pilot study. This supports the assumption that the handout can be used in further studies to test its effectiveness with only minor revisions to the form.

Influential Variables

Finally, variables which might influence a parent's decision to return to their own GP/pediatrician or to the PED for reassessment of their child's continuing symptoms of vomiting and/or diarrhea, were explored in this study. The Health Belief Model (HBM) as adapted by Becker et al. (1977) (Appendix 1) has been used as a framework to understand how certain influential variables may have affected the decisions made by parents about their child's need for further assessment by a physician. The HBM illustrates how demographic variables such as age and gender affects both the person's perceived susceptibility to and the perceived threat of a particular disease process. Similarly, the age and gender of a child may influence a parent's decision about the impact of a particular disease. Social class, pressure from the peer or reference group, personality influence and prior experience with a disease influence how serious the disease is perceived to be and hence, decisions made to manage the disease process. Cues

to action are influences that encourage a person to take or follow though with certain actions including advice from others, illness experience of a friend or family member, mass media messages, reminder calls, and continued contacts with heath professionals. The demographic information sheet (Appendix 4) incorporated several possible cues to action that might have influenced or modified parent decision-making in this study.

The small sample size prevented these variables from being fully tested. Three variables had an apparently statistically significant relationship with return types. These variables were the household composition (single versus 2-parent homes) and the location where the child spent his or her sick days and evenings. In this pilot study, the sample size was not sufficient to examine fully, the relationships between all of the variables, as proposed in research question seven, and their relationship with the types of returns made by the parent-child dyads. However, some trends were identified that warrant further investigation in subsequent studies.

The question of where a child stays during the days and evenings when they are sick was likely affected by the sample size and the distribution of the results. This distribution of data affected the chi-square tests of independence. Data showed that most (n=28) of the children stayed home during the day when they were sick and even more (n=35) stayed home in the evenings when they were sick. When looking at the types of returns parents chose to make with children who stayed home during the day when the child was sick, sixteen parent-child dyads did not return and twelve parents chose to return. This suggests that with a larger sample size, this variable would likely prove not to be significant and should not be included in a subsequent study. Finally, these categories might not have theoretical basis as children are normally at home when ill.

The question of whether return visits differed between single and two-parent households may also have been affected by unequal distributions. There were only four single parents who competed the study (of seven who were enrolled). Of these four, two returned for physiologically warranted reasons, and two returned for non-physiologically warranted reasons. All of the parent-child dyads who did not return were from the double family households. For this reason, I sought rationale in the literature for why household composition might be a significant variable for people choosing to have their children reassessed by a physician.

While the work of Semchuk and Eakin (1989) is 14 years old, it is nonetheless very relevant for this study. They discussed children's health and illness behavior in relation to their having single working mothers. The mothers in their study had lower incomes and fewer supportive social networks than the two-parent family. The mothers have to balance the nurturing and providing roles for their children, and this can prove to be difficult. Role flexibility, the mother's ability to adapt to an emergency, influences their perception of whether a child's illness is a crisis or not. Again, social support and a flexible work environment are important. Semchuk and Eakin stated that the higher income-earning mothers with flexible work situations, a large supportive network of family and friends and/or hired caregivers cope much better with their children's illness than mothers without these benefits. These mothers also tend to use pediatricians or family doctors more than Emergency Departments or medical clinics because of the flexibility in their workplace. Therefore, the mothers who tend to use Emergency Departments or medical clinics are those working around more rigid workplace conditions and tend to experience more stress when their child is ill.

Friedemann and Andrews (1990) examined the single parent family in terms of familial support. From their literature review, they found that the stress levels are higher in single parent families due in part to lower incomes which might translate to more frequent changes in residence, difficulty providing the basic necessities of life, or living in areas that are not as safe as other areas. Parents who work outside the home often require childcare arrangements, which bring additional economic burdens. These parents often have less time and energy to spend with their children. They demonstrated that single parent households, on average, have one-third the income as two-parent households. These households tend to be associated with higher stress levels for the parent who is assuming more responsibilities as the sole adult raising the children. Lack of familial support was another problem for the single parent. The parents in their study had children at a younger age and may not have completed the education that they had initially planned. Also, families in their study perceived that external sources of support, more suitable employment, childcare and managing financial resources were important.

A larger sample size should be used to determine if the variable of single versus two-parent households is indeed significant when considered with the types of returns made by parent-child dyads. Further analysis of the demographic factors which might distinguish the single parent household from the double parent household needs to be done in order to identify which of these factors are important.

Case Study

One participant stands out in this study because of her particular responses during both the discharge teaching intervention and the follow-up phone call. The HBM is an organizational framework useful in explaining this situation.

This participant was within the mean age group for parents and her child was within the mean age group for children. She had two other children and lived in a two-parent household. She had university or college education and routinely saw a family physician for her children. She made use of a telephone advice service and had experience managing vomiting and/or diarrhea.

When I first came into the room, she was standing with her arms folded across her chest, leaning back and tapping her foot on the floor. She stood during the entire intervention and responded with short answers to my questions. I learned during the intervention that it was her long time family physician who sent her to the PED for assessment. The expectation was that her child would receive intravenous rehydration and possible admission. The emergency physician who had assessed her child felt that oral rehydration was appropriate and that there was no need for admission. It was clear she thought her family physician's suggestion for managing her child's symptoms was more accurate than that of the PED physician. During the provision of the standard discharge teaching intervention, she did not ask additional questions. The intervention session lasted only ten minutes as compared to other sessions that lasted up to a half of an hour, and then her child was discharged.

At the time of the follow-up phone call, her child had improved. This participant began the conversation by stating that she did not follow most of the guidelines because she did not believe they were valid. She saw her physician the day after the visit to the PED and he recommended using Gatorade, juices, pop, soups, and to withhold milk for fear of it curdling in the child's stomach. This was the complete opposite to the recommendations in the discharge teaching handout. She did not attempt to feed her child

at the six to twelve hour mark. In fact, he did not eat for a "couple of days". She did not trust the information nor would she use most of it. Yet, when she gave her ratings on the numeric rating scales to assess the handout, she rated the ease of reading, the ease of understanding and the completeness of information all with a score of ten. For the scale rating ease of use, she gave the handout a seven and for the overall handout rating, she gave the handout a six. She stated "it was well put together, just not for me because she "was the old school with soup, broth - things that [she'd] used in the past and things [she'd] used on herself". Her response to the first part of the hypothetical situation question was to proceed immediately to her own physician without attempting to implement any of the recommendations in the handout. For the second half of the hypothetical question situation, she stated she would take her son directly to the Emergency Department.

This parent perceived her child's symptoms to be very serious. Her own physician sending her to the PED for further assessment reinforced her concerns. Her personal perceptions did not align with those of the PED physician. This might have made her less receptive to any recommendations made by the emergency physician and possibly to those in the discharge teaching intervention handout.

Understanding some personality and psychological factors might be important to comprehend her responses. She was very clearly able to articulate her wishes in regards to the care she felt her child required, which were not congruent with the management of the child's symptoms in the PED. Structural variables (as described in the HBM) such as knowledge and prior experience with this disease process may have influenced her responses during the discharge teaching intervention. The family physician who referred

her child to the PED affirmed her beliefs for what her son needed and served as a sociopsycologic influence (as described in the HBM). Likely, this physician's opinion was the only cue to action that would be significant for her at the time. The likelihood that she would follow the suggestions in the handout were definitely affected by her perceived benefits of the information in the handout and the barriers to action (such as her own mistrust of the information compounded by her physicians advice). Had I known more about her situation prior to the discharge teaching intervention, I might have been able to address some of her concerns and increase the likelihood that she would take the recommended actions. I might have had the opportunity to explore with her the reasons why she felt that her child had not been attended to as she thought he needed to be. I could have had her explain her understanding of the management of vomiting and diarrhea and then been able to discuss with her the reasons that the evidenced based rationale behind the recommendations in the discharge teaching handout. I could have also discussed with her that the recommendations in the handout are just that, and the possible implications of other forms of rehydration management might be for her child. I might have been able to present more information to support why these actions were recommended thus addressing some of her concerns.

The HBM can be used to better understand a person's reaction to a situation and to modify information to enhance compliance with the desired outcome. In this case, the HBM was used in retrospect to understand the reaction of one parent to the discharge teaching intervention. It is important to examine why some people do not follow the recommended courses of action so that the information might be adapted to more effectively meet their needs.

Direction for Future Research

Further development of an enhanced discharged teaching intervention for parents faced with managing their child's acute vomiting and/or diarrhea is warranted. This pilot study was not able to demonstrate a relationship between parental confidence levels, perceptions of application ability and the decision to return to a physician for reassessment quantitatively because of the small sample size, however there was support qualitatively. Further studies in the PED are needed to determine the magnitude and direction of the relationships described in this pilot study and, by using larger sample sizes, determine if the qualitative information can be supported with significant statistical results. Additionally, further studies should be conducted in other Emergency Department settings where parents present their children for assessment and treatment of vomiting and/or diarrhea to determine if the discharge intervention should be incorporated as a standard discharge teaching protocol. Part of a future study should be done looking at the category of the non-return to ensure that a reliance on the discharge teaching intervention handout is not putting children at risk of succumbing to dehydration because of a false sense of security instilled in parents by having the handout as a reference. Parents who participated in this study were not asked about their household income or their sources of external support such as extended families or friends. Practical and clinically based variables which might influence a parent's decision to take a child to the PED should be examined. These variables should include such things as whether and when the parent is able to arrange childcare for any siblings in order to take their sick child to the PED. Also, an examination of when parents are able to bring children to the PED because of availability of transportation. Finally, whether a parent is able to take time off work to

care for a sick child and whether household income status has a bearing on the decision process to bring a child to the PED for assessment of vomiting and/or diarrhea could prove to be beneficial. The sample in this study likely was affected by the location at which it was conducted. Future studies need to use a more representative sample group by being based out of the other Emergency Departments in the city. Additionally, a more objective and standardized discharge teaching intervention should be developed and tested using the handout as a basis. The literature shows that the highest success in teaching and learning comes from the integration of video, handout, and follow-up contact. A study should be done to develop and test this group of interventions (video, handout and follow-up) for this subject matter.

Significance of the Study

In today's healthcare system with scarce resources and increasing demands for health care, it is essential that Emergency Departments be used only in case of emergency. Every visit to the emergency represents a time commitment for the patient and family and a cost to the health care system. It is not uncommon to hear parents state that they did not want to come to emergency, but did not know what else to do. The discharge teaching intervention in this pilot study has demonstrated promise in helping parents make more informed decisions about managing their child's symptoms of vomiting and/or diarrhea and when deciding if their child requires further assessment by a physician. By further testing tools, such as the one developed for this study, it might be possible to show that parents might use the PED more appropriately with a reliable reference to consult when their child has vomiting and/or diarrhea.

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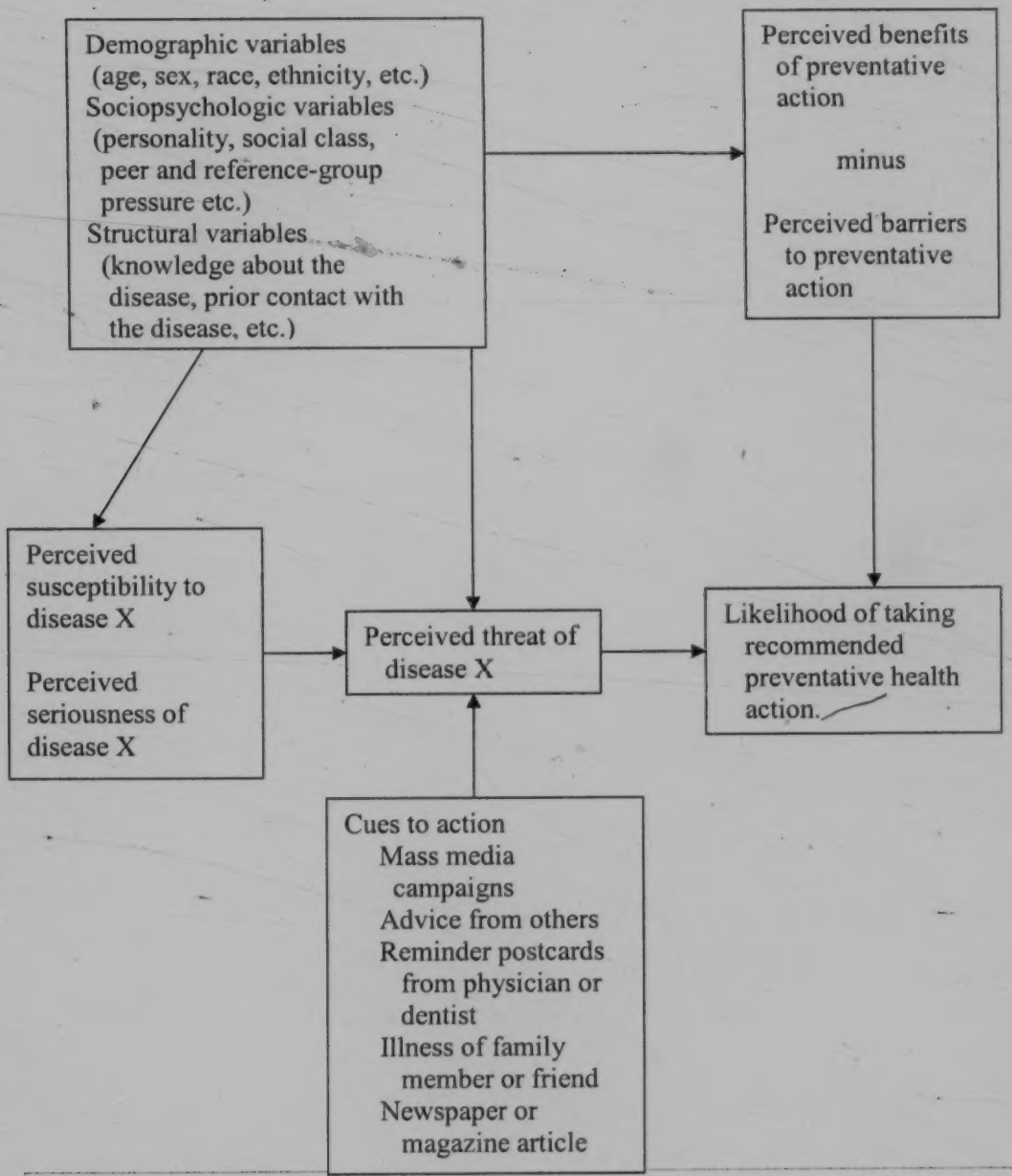
Supplemental Tables

Table S- 1

Cross-tabulation table for household type and return type

		Household		
		Single	Double	Total
		Physiologically warranted		
	Count	2	4	6
	Expected	0.6	5.4	6.0
	% total	5.3%	10.5%	15.8%
		Non- physiologically warranted		
	Count	2	9	11
	Expected	1.2	9.8	11.0
	% total	5.3%	23.7%	28.9%
		No Return		
	Count	0	21	21
	Expected	2.2	18.8	21.0
	% total	0.0%	55.3%	55.3%
		Total		
	Count	4	34	38
	Expected	4.0	34.0	38.0
	% total	10.5%	89.5 %	100.0%

Appendix 1: The Health Belief Model



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Appendix 2: Teaching Intervention

YOUR CHILD HAS DIARRHEA OR IS VOMITING. NOW WHAT CAN YOU DO?

What is diarrhea ?

3 times the number of his or her normal number of stools (poops) in one day
2 or more watery stools in one day (more watery than normal)

It is normal for breastfed babies to have seedy, watery and mustard-yellow colored stools.

What causes diarrhea?

Mainly viruses (germs that don't need an antibiotic)
Rarely a bacteria or parasite (germs that might need an antibiotic)
- Some bacteria can cause food poisoning.

What makes diarrhea worse?

Antibiotics can make diarrhea worse.
Not eating can make diarrhea worse.
Do not give any medicine to stop diarrhea unless ordered by a doctor.
- These medicines can make the diarrhea last longer.
- The diarrhea will stop on its own.

It may take two weeks for your child's stools to return to normal shape or amount. This is a normal part of how your child gets better.

How do I stop the spread to other people?

When you change diapers or go to the bathroom, viruses get on your hands. You will not see them. They can be spread to others by touch.
- Wash your hands after each diaper change.
- Wash hands after going to the bathroom.
- Wash your hands before you touch food.

What is vomiting?

Forceful throwing up
Child uses tummy muscles with vomiting.

What causes vomiting?

Mainly viruses
Rarely bacteria
Other causes (including pain, food poisoning and many other reasons)

What makes vomiting worse?

Giving too much to drink or eat too quickly.
- Wait 6 hours before giving solid foods.
- Give small amounts to drink, often.

Do not give Gravol to stop your child from vomiting.
- This can make your child very sleepy.
- It does not usually help stop vomiting.

How do I stop the spread to other people?

After your child vomits, clean him/her up and change his/her clothes.
Try not to touch the vomit too much.
Make sure that you and your child wash your hands after your child vomits.

FIRST 6 - 12 HOURS	6 Months or Less	7 – 24 Months	2 – 5 Years	6 – 16 Years
How do I know if my child needs more liquids? (dehydration)	No tears Dry mouth and tongue Child is more sleepy and/or less active Irritability (being more cranky/fussy, won't settle)	No tears Dry mouth or tongue Increased thirst Child is more sleepy and/or less active Irritability (being more cranky/fussy, won't settle)	No tears Dry mouth or tongue Increased thirst Child is more sleepy and/or less active Irritability (more cranky)	Dry mouth or tongue Increased thirst Child is more sleepy and/or less active Irritability (headache, more whiny, more cranky)
What should my child have in the first 6 hours?	Continue to breastfeed if normally breastfed. If bottle fed, stop formula and use: Pedialyte Gastrolyte (be careful to mix it correctly)	Continue to breastfeed if normally breastfed. If bottle fed and or on solid foods, stop these and use: Pedialyte Gastrolyte (be careful to mix it correctly) May give milk in addition	Stop all regular foods and drinks. Offer: Pedialyte Gastrolyte (be careful to mix it correctly) May give milk in addition	Stop all regular foods and drinks. Offer: Pedialyte Gastrolyte (be careful to mix it correctly) May give milk in addition
How much liquid should my child drink?	Breast-feed as the baby wants. If not breastfed, offer: 1 – 3 ounces of drinks every hour If child won't take a cup, use 1 tbsp. of fluid every 10 – 15 min.	If still breast-feeding, continue to feed as the baby wants and use drinks for more fluids. If not breastfed, offer: 3 – 4 ounces of drinks every hour	Offer: 4 – 8 ounces of drinks every hour	Offer: If under 11 years old: 8 ounces of drinks every hour OR If over 11 years old: 10 – 16 ounces of drinks every hour
DO NOT give:	Water Milk (milk should not be offered to any child under 9 – 12 months old)	Water Sports drinks (e.g. Gatorade) Pop or Fruit juices Kool – aid Broth (soup) Gelatin dessert (e.g. Jello)	Water Sport drinks (e.g. Gatorade) Pop or Fruit juices Kool – aid Broth (soup) Gelatin dessert (e.g. Jello)	Water Sport drinks (e.g. Gatorade) Pop or Fruit juices Kool – aid Broth (soup) Gelatin dessert (e.g. Jello)

AFTER 6 - 12 HOURS

	6 Months or Less	7 – 24 months	2 – 5 Years	6 – 16 Years
When can my child eat?	If breastfed, continue feeding as the baby wants. If formula fed, start within 6 hours after vomiting started.	If breastfed, continue feeding as the baby wants. Start feeding within 6 hours after vomiting started.	Start feeding within 6 hours after vomiting started.	Start feeding within 6 hours after vomiting started.
What should I give him/her?	Breast milk or formula	Feed regular foods. Offer small amounts often, based on how your child managing food. Continue to encourage fluids.	Feed regular foods. Offer small amounts often, based on how your child managing food. Continue to encourage fluids.	Feed regular foods. Offer small amounts often, based on how your child is managing food. Continue to encourage fluids.
When should we visit a doctor again for vomiting or diarrhea?	If your child: is vomiting and is under 2 months old is vomiting harder or more often then before has severe stomach (abdominal) pain has black or red diarrhea is vomiting blood is vomiting bright green	If your child: is vomiting harder or more often than before has severe stomach (abdominal) pain has black or red diarrhea is vomiting blood is vomiting bright green	If your child: has black or red diarrhea is vomiting harder or more often than before has severe stomach (abdominal) pain is vomiting blood is vomiting bright green	If your child: has black or red diarrhea is vomiting harder or more often than before has severe stomach (abdominal) pain is vomiting blood is vomiting bright green
When should I call 911 and go to the Emergency Department again?	If your child: is less active or less awake is very sleepy is limp has grayish colored skin	If your child: is less active or less awake is very sleepy is limp has grayish colored skin	If your child: is less active or less awake is very sleepy is limp has grayish colored skin	If your child: is less active or less awake is very sleepy is limp has grayish colored skin

Appendix 3: Patient Information Package

Title of Research Study	*A Pilot Study of a Discharge Teaching Intervention for Families in the Pediatric Emergency Department with Children Experiencing Acute Vomiting and/or Diarrhea.*
Principle Researcher	Wendy Gillespie, Master's of Nursing Candidate
Co – Researchers	Jeanette Boman RN, PhD. Lynne Ray RN, PhD. William Sevcik, MD

Purpose: A new discharge teaching handout for children with vomiting and/or diarrhea has been written. I would like your input about this handout.

Introduction: Your child came to the Pediatric Emergency Department because of vomiting and/or diarrhea. I want to improve the teaching given to parents before they go home with their child. I want to find out how helpful the new handout is for parents.

Procedure: After you have agreed to join the study, I will teach you about taking care of your child at home and how to decide if a doctor needs to see your child again. I will ask you some questions about you and your child. I will also, need to know your telephone number at home and when it is best to call you. Seven days after your visit to the Pediatric Emergency Department, I will call you. If you agree, this phone call will be taped to make sure I correctly get the information you give me. I will ask you for your opinions about the handout, ask how your child is feeling, and whether your child has seen another doctor.

If you do need to return to the Pediatric Emergency Department in seven days after you were first seen, I will look at your child's chart for each visit. I will be looking for: the information you gave about why you brought your child back. I will also look at any tests that were done, what was done to help your child, whether you child was admitted into the hospital, and what the diagnosis was. I also will look to see if you child needed to be referred to anyone else. If you take your child to see your own doctor in the week after you were seen at the Emergency Department, I will ask you to tell me why you went to see the doctor and what you were told by that doctor.

Pediatric Emergency Department. Your comments about the handout could help change the teaching done with parents in the Pediatric Emergency Department.

Possible risks: I do not believe that there are any risks for being in the study.

Confidentiality: The information we get from this study will fall under the rules of the University of Alberta Hospitals and the University of Alberta. Study information will not be part of your child's medical record. It will be stored in a safe and locked place. Your name will not be on the information. The other people on the research team will be able to see the information, but will not know your name. Any report written as a result of this study will never give out your name.

Voluntary Participation: If you do not join the study or leave the study at any time, the care your child gets from the doctors and nurses will not change. You can choose to leave the study at any time.

Contact Names and Telephone Numbers: If you are worried about any part of this study, you may contact the Patient Relations Office of the Capital Health Authority at (780) 407 – 1040. They do not work with the study researchers. You can ask me any questions about the study at any time.

Consent Form

Initials _____

Study Id. Number _____

A Pilot Study of a Discharge Teaching Intervention for Families in the Pediatric Emergency Department with Children Experiencing Acute Vomiting and/or Diarrhea.

Principle researcher: Wendy Gillespie, Master's of Nursing Student
University of Alberta, Faculty of Nursing (492-6138)

Co – Researchers Jeanette Boman RN PhD, University of Alberta, Faculty of Nursing
Lynne Ray RN PhD, University of Alberta, Faculty of Nursing
Dr William Sevcik MD, University of Alberta, Emergency Medicine Division

Do you understand that you have been asked to be in a research study?	**Yes**	**No**
Have you read and received a copy of the attached information sheet?	**Yes**	**No**
Do you understand the benefits and risks involved in taking part in this research study?	**Yes**	**No**
Have you had a chance to ask questions and discuss this study?	**Yes**	**No**
Do you understand that you are free to refuse to join or leave the study at any time? You do not have to give a reason, and it will not affect your care.	**Yes**	**No**
Do you understand how your information will be kept safe?	**Yes**	**No**
Do you understand who will have access to your information?	**Yes**	**No**
Do you understand that no one will know who you are and what you said during and after the study?	**Yes**	**No**

This study was explained to me by: _____

I agree to take part in this study.	**YES**	**NO**	
_____	_____	_____ // _____	
Signature of Research Participant	Printed Name	Date	Time
_____	_____	_____ // _____	
Witness	Printed Name	Date	Time

Appendix 4: Demographic Information Survey: About You and Your Child

1) Your child's birth date: _____/_____

Month / Year

2) Number of siblings: _____

a) Birth dates of siblings: _____/_____ _____/_____

Month / Year Month / Year

_____/_____ _____/_____

Month / Year Month / Year

3) Your birth date: _____/_____

Month / Year

4) Your relationship to the child _____

Number of parents in house:

1 parent _____

2 parent _____

5) When your child is healthy, where does she/he spend:

a. The day? _____

b. The evening? _____

6) Has your child, or other children, had an illness like this before?

Elementary school _____

Junior high/middle school _____

High school _____

Some college or university/college courses _____

College diploma or university degree _____

Post Graduate courses/degree _____

10) Do you have a pediatrician or general family doctor for your child/children?

_____

11) What (if any) health care resources do you use in the community?

Capital Health Link (408- 5465) _____

Public Health clinics (walk-in clinics) _____

Other (please specify) _____

Appendix 5: Follow Up Questionnaire

Before we start this survey, can I get your permission to tape record this conversation to make sure that all of your opinions and comments can be accurately transcribed after our conversation has finished. All of your answers will remain anonymous and you will not be able to be identified in anyway from your answers. _____

Please indicate how you feel by choosing the number that best describes your answer using a scale of 1 to 7 where 1 means "not at all" and 7 means "very much".

1) How easy was it to read the information handout that you received in the Pediatric Emergency Department?

1 2 3 4 5 6 7 8 9 10

2) How easy was it for you to understand the information in the handout that you received in the Pediatric Emergency Department?

1 2 3 4 5 6 7 8 9 10

3) How easy was it for you to use the information in the handout that you received in the Pediatric Emergency Department to care for your own child after you went home?

1 2 3 4 5 6 7 8 9 10

4) How much did you like the way the information handout that you received in the Pediatric Emergency Department (considering things like the colors that were used and the way it is presented on the pages)

1 2 3 4 5 6 7 8 9 10

5) What was your overall impression of the information handout that you received in the Pediatric Emergency Department?

1 2 3 4 5 6 7 8 9 10

_____

_____

_____

7) How confident did you feel taking your child home after going over the information handout in the Emergency Department?

1 2 3 4 5 6 7 8 9 10

8) How confident did you feel in your knowledge of managing your child at home with vomiting and/or diarrhea to prevent dehydration using the information handout you received in the Emergency Department?

1 2 3 4 5 6 7 8 9 10

9) How confident did you feel in your ability to potentially recognize the signs of dehydration in your child using the information handout you received in the Emergency Department?

1 2 3 4 5 6 7 8 9 10

10) How well do you feel you were able to apply the information in the handout to managing your child's vomiting and/or diarrhea?

1 2 3 4 5 6 7 8 9 10

11) Since your child was seen in the Pediatric Emergency Department, where did she/he

a. Spend the days _____

13) Did you have a doctor see your child/children after you left the Pediatric Emergency Department for further treatment of vomiting and/or diarrhea.

YES NO

If yes, where and when and why (what was diagnosed or done)?

Where _____

When _____

Why _____

14) I have one last scenario for you to work through, similar to the ones we talked about before you went home from Emergency. You can refer to your information handout at any time, if you would like. Tell me what you would do if this were your child.

(Give the parent the number 3 scenario – set for the age of the child).

What did they say _____

Practice Scenarios – 0 to 24 months

1) Your child has had diarrhea for the last 3 days and has not had very much to drink in the last 24 hours. She/he has been sleeping all day today. When you go into her/his room, it is hard to wake her/him up and he is very groggy/sleepy. Her/his skin is pale, seems to be grey in color, and is cool when you touch him. She/he has a weak cry only.

What would you do next?

Answer – Take child to Emergency Department (by ambulance)

2) Your child has been vomiting a couple of times in the last 24 hours but not in the past 4 hours. She/he has had diarrhea a couple of times. She/he seems to be really thirsty and when she drinks and she/he keeps it down. She looks tired, and a little pale, but otherwise normal.

What would you do next?

Answer - Keep child at home
Rehydrate as appropriate for age
Introduce bland foods between 6 – 12 hours from start
Watch for worsening in condition

3) Your child had vomiting and diarrhea last week, but hasn't had any for 4 days. She/he seemed to be okay yesterday. Today, however, she/he wakes up in the morning and looks uncomfortable, she/he cries sometimes but then is completely

What would you do next?

Answer – as above

Later that night, your daughter/son is not able to keep anything down. It seems to you that her/his tummy really hurts and when she/he seems to have this pain, she/he cries very strongly. You notice some spots of red in her/his diapers when you change them. She/he now looks pale, her/his skin is a little grey. She /he is really thirsty and her/his mouth and tongue look sticky.

What would you do next?

Answer – Take her to a physician – either own or emergency.

Ambulance not necessary.

Practice Scenarios – age 3 and up

1) Your child has had diarrhea for the last 3 days and has not had very much to drink in the last 24 hours. She/he has been sleeping all day today. When you go into her/his room, it is hard to wake her/him up and he is very groggy/sleepy. Her/his skin is pale, seems to be grey in color, and is cool when you touch her/him.

   What would you do next?

   Answer – Take child to Emergency Department (by ambulance)

2) Your child has been vomiting a couple of times in the last 24 hours but not for 4 hours. She/he has had diarrhea a couple of times. She/he tells you she is really thirsty and when she/he drinks, she/he feels better and she keeps it down. She/he looks tired, and a little pale, but otherwise normal.

   What would you do next?

   Answer – Keep child at home
   Rehydrate as appropriate for age
   Introduce bland foods between 6 – 12 hours from start
   Watch for worsening in condition

3) Your child had vomiting and diarrhea last week, but hasn't had any for 4 days. She/he was back at school yesterday and seemed to be okay. Today, however, she/he wakes up in the morning complaining of tummy pain ("kind of like stomach ache"). She/he tries to drink juice because she is really thirsty but throws up right

Later that night, your daughter/son is not able to keep anything down. She/he tells you that her/his tummy really hurts and she/he cries with pain. She/he tells you that there is sometimes something red in the toilet when she/he has the diarrhea. She/he now looks a pale and her skin is a little grey. She/he tells you she is really thirsty and her/his mouth and tongue look sticky.

What would you do next?

Answer – Take her to a physician – either own or emergency.

Ambulance not necessary.

Appendix 6: PED Chart Review Summary

1) History obtained from the parents

_____

_____

_____

2) Diagnostic or radiographic tests ordered

_____

_____

3) Presence/absence of abnormal findings

_____

_____

4) Treatment administered (for example intravenous rehydration, oral rehydration, observation) _____

_____

_____

5) Admission into the hospital _____

6) Diagnosis _____

7) Referrals made for the child _____

8) To Whom _____

9) Was the visit physiologically warranted _____